ACTION DESCRIPTION MEMORANDUM

FOR THE

OPERABLE UNIT 4 (SOLAR EVAPORATION PONDS)

INTERIM MEASURE/INTERIM REMEDIAL ACTION

Prepared by the
Ecology and NEPA Division

EG&G Rocky Flats, Inc.

November 19, 1993

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

ACTION DESCRIPTION MEMORANDUM FOR INTERIM MEASURE/INTERIM REMEDIAL ACTION AT OU 4 (SOLAR PONDS)

1.0 INTRODUCTION

This Action Description Memorandum has been prepared to assist in determining the proper level of National Environmental Policy Act documentation for remedial actions to be taken at Operable Unit (OU) 4 at the Department of Energy's Rocky Flats Plant (RFP) north of Golden, Colorado.

2.0 PURPOSE OF AND NEED FOR THE PROJECT

OU 4 is one of 16 operable units at RFP and is identified as the Solar Evaporation Ponds. The five ponds are located in the northeast quadrant of the developed area of the plant site as shown in Figure 1. The ponds, constructed at various times, were used to hold liquid wastes while the liquids were allowed to evaporate. It is believed that the ponds, which were lined, leaked, allowing contaminated liquids to enter the underlying soil. Three of the five ponds are empty while the remaining two ponds contain contaminated liquids and sludge. The pond lining material, remaining sludge, underlying soil that has been contaminated, and a metal building with its associated components located in the pond area are to be remediated under provisions of, and as required by, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act and the Inter-Agency Agreement between the Department of Energy, Colorado Department of Health and the Environmental Protection Agency.

3.0 PROPOSED ACTION

Because preparation of the Phase 1 Interim Measure/Interim Remedial Action Decision Document for OU 4 has not yet begun, neither has identification of a preferred remedial action. Preliminary work on alternative remedial actions has resulted in development of two conceptual alternatives: covering and removal.

Covering

Covering the ponds would require an estimated 100,000 cubic yards of clean fill, assuming that the ponds would have to be excavated to an average depth of 5 feet. Shallower average excavation depths, or not having to excavate certain ponds at all, could reduce that figure. The necessary fill material would, preferably, be taken from one or more locations at RFP. Potential locations and acreage have not been identified. The entire approximately 12-acre (4.9 hectare) area of OU 4 would be covered with the fill material which would be graded to provide positive drainage away from the site.

The various pond-related components would be left in place, or removed, treated and returned to the ponds. The components would then be covered with a cap. The pond-related components consist of pond liners, consisting of various combinations of asphalt, concrete, wood, gravel, membrane liner and other materials, remaining sludge and the concrete foundation and floor of Building 788. Related items at Building 788 include containers of pond-related waste, two cement silos, a clarifier tank, pug mill, mixer and an approximately 8-foot by 30-foot trailer used as break trailer by workers on the pondcrete project. Except for the containers of waste, these items and the metal building itself would be decontaminated if necessary and removed from the area for reuse or other disposal. All contaminated material not placed back in the pond area prior to placement of the cover would be stored in existing facilities or shipped off-site as it is generated.

Underground and above-ground utilities that could interfere with the long-term operation of the cover would be relocated or removed. Grading would take place at the north edge of the ponds to relocate soils now in the north berm of ponds 207A and 207B North to the adjacent hillside from which they were originally taken to enhance drainage. Excess soil would be used as fill material for the ponds.

The cover could consist of 1) fill material, 2) a protective cover such as a tarp or flexible membrane liner over the fill to minimize erosion and infiltration of precipitation, or 3) an engineered cover, such as a membrane liner over a layer of clay, over the fill to provide an impermeable barrier. In the case of the engineered cover, a drainage layer, a filter fabric and a layer of topsoil would be placed on top of the membrane liner. The topsoil would be seeded unless the protective cover were applied. Topsoil would be in addition to the clean fill and could come from on- or off-site locations.

Removal

The second alternative is removal and would involve removal of all contaminated material from the pond area, storage of the material elsewhere at RFP pending a later program to treat it or send it off site for permanent disposal, regrading of the berms north of ponds 207A and 207B North, and placement and seeding of a cover over the 12-acre pond area. The material to be removed would consist of approximately 10,000 cubic yards of pond lining, between approximately 5,500 and 33,000 cubic yards of soils excavated from between 6-inches and 3-feet deep, approximately 3,000 cubic yards of residual sludge and an unestimated but relatively small volume of rubble from Building 788 and its related equipment described above. Under the removal alternative, these wastes, plus liquid waste from soil washing, are estimated to total between 35,000 and 68,000 cubic yards after packaging, based on current understanding of the possible size of the project.

The volume of material removed from the ponds would increase the volume of clean fill needed for the cap in order to have a cap with a shape that provides drainage to its perimeter. At the same time, if all or most of the contaminated material were replaced in the ponds, the cover, though including the same acreage, would be thinner and therefore require less fill material. Under the removal alternative with little if any material returned to the ponds, up to 133,000 cubic yards of clean fill could be required for the cap.

Treatment of contaminated material may take place as part of this project or may be deferred to an unspecified later time. Treatment could include vitrification, solidification, bio-denitrification, precipitation, soil washing/extraction or adsorption and could be applied to just the residual sludge and soils, or to the sludge, soils, liners and rubble from the foundation and floor of Building 788. As indicated above, treated material would be disposed of by one or a combination of three means: replacement in the ponds prior to installation of the cap, storing it elsewhere at RFP pending final disposal on- or off-site, and/or putting material that is sufficiently clean in the RFP landfill. Equipment that is, or can be made, sufficiently clean would be reused or otherwise recycled.

4.0 Potential Environmental Impacts

4.1 Destruction of habitat

Habitat would be destroyed in the area(s) from which the up to 133,000 cubic yards of clean fill were taken. Potential borrow sites have not been identified, but removal of the required fill material would temporarily destroy habitat for flora and fauna and the existing natural soil horizons. It is planned that the material would be removed in a manner that would minimize long-term impacts by such procedures as:

- excavating only above the groundwater table to avoid affecting groundwater;
- grading and revegetating borrow areas to be consistent in appearance with adjacent lands; and
- avoiding excavation in sensitive area such as wetlands, floodplains, and areas that potentially provide habitat to threatened or endangered species or other species of concern.

The area of Solar Ponds provides very little natural habitat, having been an industrial site for more than 30 years. The severely disturbed nature of the environment around the Solar Ponds is home to weedy plant species as well as rodents including mice, deer mice and rabbits.

4.2 Groundwater

It is expected that excavations at, or for, OU 4 would be shallow enough to avoid coming in contact with the water table either at the OU or at the site(s) from which the clean fill would be taken, leaving groundwater unaffected.

Covering 12 acres with an impermeable cap brings with it the possibility of affecting groundwater levels and flows immediately below. Any consequences of this possible impact would be largely eliminated by the fact that runoff from the impermeable cap would be able to enter the groundwater around the perimeter of the cap. Thus, the total volume of water available to percolate to the groundwater table would remain the same.

There is a system of French drains on the down-gradient (north) side of the Solar Ponds between the Ponds and Walnut Creek called the interceptor trench system. This system collects water that has leaked from the Ponds and transports it to a treatment plant for evaporation or for treatment prior to discharge to Walnut Creek. Installation of a cap would not be expected to affect operation of the interceptor trench system.

4.3 Surface Water

No impacts to surface water would be expected from the Proposed Action.

4.4 Air

Excavation of clean fill as well as removal of residual sludge and contaminated soil have the potential to result in fugitive dust. It is expected that standard dust suppression procedures would mitigate this possibility.

4.5 Human Health

Removal of contaminated pond lining material, excavation of contaminated soils and demolition and decontamination of Building 778 and the related equipment carry with them the potential for exposure of workers and, to a lesser extent the public, to the contaminants. This potential is expected to be kept well within acceptable levels by various operating procedures common at RFP including dust suppression, appropriate levels of personal protective equipment and implementation of appropriate procedures for handling, storing and inspecting contaminated materials before and after they are placed in containers.

ROCKY FLATS PLANT

ECOLOGY & NATIONAL ENVIRONMENTAL POLICY ACT DIVISION
ENVIRONMENTAL CHECKLIST

NCC# 93-408

CHARGE NUMBER: 989195

I. Date: 11/11/93

II. Activity/Project Name: OU 4 Interim Measure/ Interim Remedial Action

III. Authorization/Project Number:
ADS Number (E&WM only): 1258

IV. EG&G Project Administrator: Randy Ogg, ER/SPP

DOE Program Sponsor:

V. Initiating Line Manager: Randy Ogg, X8608

VI. A. Project/Activity Description:

OU 4 is one of 16 operable units at RFP and is identified as the Solar Evaporation Ponds. The five ponds are located in the northeast quadrant of the developed area of the plant site as shown in Figure 1. The ponds, constructed at various times, were used to hold liquid wastes while the liquids were allowed to evaporate. It is believed that the ponds, which were lined, leaked, allowing contaminated liquids to enter the underlying soil. Three of the five ponds are empty while the remaining two ponds contain contaminated liquids and sludge. The pond lining material, remaining sludge, underlying soil that has been contaminated, and a metal building with its associated components located in the pond area are to be remediated under provisions of, and as required by, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act and the Inter-Agency Agreement between the Department of Energy, Colorado Department of Health and the Environmental Protection Agency.

Reviewed For Classification

By:_____

Date:_____

Because preparation of the Phase 1 Interim Measure/Interim Remedial Action Decision Document for OU 4 has not yet begun, neither has identification of a preferred remedial action. Preliminary work on alternative remedial actions has resulted in development of two conceptual alternatives:

Covering the ponds would require an estimated 100,000 cubic yards of clean fill, assuming that the ponds would have to be excavated to an average depth of 5 feet. Shallower average excavation depths, or not having to excavate certain ponds at all, could reduce that figure. The necessary fill material would, preferably, be taken from one or more locations at RFP. Potential locations and acreage have not been identified. The entire approximately 12-acre (4.9 hectare) area of OU 4 would be covered with the fill material which would be graded to provide positive drainage away from the site.

The various pond-related components would be left in place, or removed, treated and returned to the ponds. The components would then be covered with a cap. The pond-related components consist of pond liners, consisting of various combinations of asphalt, concrete, wood, gravel, membrane liner and other materials, remaining sludge and the concrete foundation and floor of Building 788. Related items at Building 788 include containers of Pond-related waste, two cement silos, a clarifier tank, pug mill, mixer and an approximatley 8-foot by 30-foot trailer used as break trailer by workers on the pondcrete project. Except for the containers of waste, these items and the metal building itself would be decontaminated if necessary and removed from the area for reuse or other disposal. All contaminated material not placed back in the pond area prior to placement of the cover would be stored in existing facilities or shipped off-site as it is generated.

Underground and above-ground utilities that could interfere with the long-term operation of the cover would be relocated or removed. Grading would take place at the north edge of the ponds to relocate soils now in the north berm of ponds 207A and 207B North to the adjacent hillside from which they were originally taken to enhance drainage. Excess soil would be used as fill material for the ponds.

The cover could consist of 1) fill material, 2) a protective cover such as a tarp or flexible membrane liner over the fill to minimize erosion and infiltration of precipitation, or 3) an engineered cover, such as a membrane liner over a layer of clay, over the fill to provide an impermeable barrier. In the case of the engineered cover, a drainage layer, a filter fabric and a layer of topsoil would be placed on top of the membrane liner. The topsoil would be seeded unless the protective cover were applied. Topsoil would be in addition to the clean fill and could come from on- or off-site locations.

The second alternative is removal and would involve removal of all contaminated material from the pond area, storage of the material elsewhere at RFP pending a later program to treat it or send it off site for permanent disposal, regrading of the berms north of ponds 207A and 207B North, and placement and seeding of a cover over the 12-acre pond area. The material to be removed would consist of approximately 10,000 cubic yards of pond lining, between approximately 5,500 and 33,000 cubic yards of soils excavated from between 6-inches and 3-feet deep, approximately 3,000 cubic yards of residual sludge and an unestimated but relatively small volume of rubble from Building 788 and its

related equipment described above. Under the removal alternative, these wastes, plus liquid waste from soil washing, are estimated after packaging to total between 35,000 and 68,000 cubic yards based on current understanding of the possible size of the project.

The volume of material removed from the ponds would increase the volume of clean fill needed for the cap in order to have a cap with a shape that provides drainage to its perimeter. At the same time, if all or most of the contaminated material were replaced in the ponds, the cover, though including the same acreage, would be thinner and therefore require less fill material. Under the removal alternative with little if any material returned to the ponds, up to 133,000 cubic yards of clean fill could be required for the cap.

Treatment of contaminated material may take place as part of this project or may be deferred to an unspecified later time. Treatment could include vitrification, solidification, bio-denitrification, precipitation, soil washing/extraction or adsorption and could be applied to just the residual sludge and soils, or to the sludge, soils, liners and rubble from the foundation and floor of Building 788. As indicated above, treated material would be disposed of by one or a combination of three means: replacement in the ponds prior to installation of the cap, storing it elsewhere at RFP pending final disposal on- or off-site, and/or putting material that is sufficiently clean in the RFP landfill. Equipment that is, or can be made, sufficiently clean would be reused or otherwise recycled.

Habitat would be destroyed in the area(s) from which the up to 133,000 cubic yards of clean fill were taken. Potential borrow sites have not been identified, but removal of the required fill material would temporarily destroy habitat for flora and fauna and the existing natural soil horizons. It is planned that the material would be removed in a manner that would minimize long-term impacts by such procedures as:

- excavating only above the groundwater table to avoid affecting groundwater;
- grading and revegetating borrow areas to be consistent in appearance with adjacent lands; and
- avoiding excavation in sensitive area such as wetlands, floodplains, and areas that potentially provide habitat to threatened or endangered species or other species of concern.

The area of Solar Ponds provides very little natural habitat, having been an industrial site for more than 30 years. The severely disturbed nature of the environment around the Solar Ponds is home to weedy plant species as well as rodents including mice, deer mice and rabbits.

It is expected that excavations at, or for, OU 4 would be shallow enough to avoid coming in contact with the water table either at the OU or at the site(s) from which the clean fill would be taken, leaving groundwater unaffected.

Covering 12 acres with an impermeable cap brings with it the possibility of affecting groundwater levels and flows immediately below. Any consequences of this possible impact would be largely eliminated by the fact that runoff from the impermeable cap would be able to enter the groundwater around the perimeter of the cap. Thus, the total volume of water available to percolate to the groundwater table would remain the same.

There is a system of French drains on the down-gradient (north) side of the Solar Ponds between the Ponds and Walnut Creek called the interceptor trench system. This system collects water that has leaked from the Ponds and transports it to a treatment plant for evaopration or for treatment prior to discharge to Walnut Creek. Installation of a cap would not be expected to affect operation of the interceptor trench system.

No impacts to surface water would be expected from the Proposed Action.

Excavation of clean fill as well as removal of residual sludge and contaminated soil have the potential to result in fugitive dust. It is expected that standard dust suppression procedures would mitigate this possibility.

Removal of contaminated pond lining material, excavation of contaminated soils and demolition and decontamination of Building 778 and the related equipment carry with them the potential for exposure of workers and, to a lesser extent the public, to the contaminants. This potential is expected to be kept well within acceptable levels by various operating procedures common at RFP including dust suppression, appropriate levels of personal protective equipment and implementation of appropriate procedures for handling, storing and inspecting contaminated materials before and after they are placed in containers.

B. Total Estimated Cost: cost estimate not available; expected to be tens of millions of dollars.

	Checklist	
	YES	NO
VII. Statutes applicable:		
A. Will the project require or potentially require an application for permit(s) or permit modification(s) under:		
1. Clean Air Act?		X
2. Colorado Air Quality Regulations 3 - APENs		X
3. Clean Water Act?		X

	YES	NO	
B. Does the project involve RCRA permitting ? (if "no", skip to C)	X		
1. Will a RCRA permit or modification be required?	X		(see Note 1)
2. Does the project include a removal?		X	
3. Does project include RCRA closure?	X		(see Note 1)
- partial?		X	
- full?	X		(see Note 1)
4. Does project include excavation or capping to meet RCRA requirements?	X		(see Note 2)
5. Will cost and duration stay within $2 million and 12 months? (Explain in project description.)		X	
C. Does the project involve CERCLA? (if "no", skip to D)	X		(see Note 3)
1. Does project include CERCLA removal?		X	
2. Will cost and duration stay within $2 million and 12 months? (Explain in project description.)		X	
D. Does the project threaten to violate statutory, regulatory, or permit requirements, or DOE Order?		X	
E. Will the action be in or near an Individual Hazardous Substance Site (IHSS)?	X		(see Note 4)
F. Does the project potentially impact threatened or endangered species or habitat, the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Fish and Wildlife Coordination Act, Colorado Non-game, Endangered Species Conservation Act?		X	
VIII. Will this project construct or require a new or expanded waste disposal, recovery, storage or treatment facility?		X	
IX. Is project needed for IAG, AIP, FFCA, or other federal or state agreement? (Specify and explain any schedule urgency and deadlines in project description.)	X		(see Note 5)
X. Is the project:			
A. new process, building, etc.or		X	
B. a modification to an existing?		X	
C. capital equipment/machinery installation?		X	

		YES	NO	
XI.	Location Items:			
	A. Will the project result in, or have the potential to result in, long term changes to the environment?		X	(see Note 6)
	B. Will the action occur outside the security zone/ protected area (i.e., outside Gate 8 at Post 100 and Gate 10 at Post 900)?		X	
	C. Will the action take place in a wetland or floodplain?		X	
XII.	Will the project result in changes and/or disturbances of the following existing considerations? (If yes, please quantify in program description).			
	A. noise levels		X	
	B. air emissions		X	
	C. liquid effluents		X	
	D. solid wastes	X		(see Note 7)
	E. radioactive wastes (including contaminated soil)	X		(see Note 7)
	F. hazardous waste	X		(see Note 7)
	G. mixed waste (radioactive and hazardous)	X		(see Note 7)
	H. chemical or petroleum product storage		X	
	I. water use (withdrawal of groundwater or diversion or withdrawal of surface water)		X	
	J. drinking water system		X	
	L. soil movement outside facility fences or beyond SWMU boundaries	X		(see Note 8)
	M. site clearing. excavation, or other physical alterations to grade	X		(see Note 9)
XIII.	Will the project threaten public health or safety?		X	
XIV.	Will the project have possible effects on the environment which are likely to be highly controversial?		X	(see Note 10)
XV.	Will the project establish a precedent for future actions that will have significant effects, or represent a decision in principle about a future consideration?		X	
XVI.	Will the project be substantially related to other actions that have individually insignificant but cumulatively significant impacts?		X	
XVII.	Will the project adversely affect federal, state, or locally designated natural areas, prime agricultural land, special water sources, or historic, archeological, or architectural sites?		X	

	YES	NO	
XVIII. Have possible pollution prevention measures been considered?	X		(see Note 11)

Note 1 - The project will involve the full RCRA closure of RCRA units 21 and 48. The Plant's RCRA permit will be modified to reflect these closures.

Note 2 - The project will involve excavation of up to an estimated 133,000 cubic yards of fill material which would be used to cap the 12-acre Solar Ponds area.

Note 3 - Remedial activities at OU 4 are to be undertaken under the provisions of both RCRA and CERCLA.

Note 4 - The activites, except excavation of clean fill, will take place in SWMU (IHSS) 101.

Note 5 - Remedialtion of OU 4 is being undertaken pursuant to schedules and requirments described in the Inter-agency Agreement (IAG).

Note 6 - Excavation of soils for capping and the subsequent presence of the cap covering 12 acres will have long-term effects on the immediate areas involved, but are not expected to have effects on the environment of the surrounding area.

Note 7 - Remedial activies are expected to generate uncontaminated, hazardous, radioactive and mixed wastes and may produce material that is contamianted initially but which is cleaned in the course of the project and becomes simply solid waste as a result.

Note 8 - Clean soil will be brought into SWMU 101 to form the cap. Contaminated soil is expected to be taken out of the SWMU for possible treatment and subsequent on- or off-site storage/disposal.

Note 9 - Excavation will be required at one or more on- or off-site locations for the material needed for the cap. Because of the volume of material required, the excavation(s) would cover a substantial area. In addition, placement of the cap may be considered an alteration to grade.

Note 10 - There could be some controversy regarding the volume of material to be excavated and the subsequent size of the area covered by the cap.

Note 11 - Pollution measures considered include dust suppression techniques during excavation and placement of the cap material, treatments to ensure that the cap doesn't erode, and procedures to ensure that pollutants do not escape to the environmment during remedial activiies.

EC Prepared by: Bill Moore Date: 11/11/93

Organization: END Bldg: T130B Extension: 4084